TECHNICAL SPECIFICATIONS

FOR

Education Building Windows Replacement (DMI)

UNIVERSITY OF COLORADO AT BOULDER

CU Project Number: CP166572

PREPARED BY:

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Division 1 provided by CU, separate document

SECTION 02080 - ASBESTOS REMOVAL

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Procedures regarding existing asbestos and PCB.

1.2 REFERENCES:

A. "Asbestos Advise to Contractor", UCB Form.

1.3 PROJECT CONDITIONS:

A. Procedures for existing asbestos and PCB.

1. In the event the Contractor encounters material reasonably believed to be asbestos or polychlorinated biphenyl (PCB):

a. Stop work immediately in affected area.
b. Report the condition to the Department of Facilities Management in writing.
c. Report the condition to the Architect in writing.
d. Resume work only when abatement work has been completed.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 02080

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed to normal view (concealed).
2. Miscellaneous wood framing and furring.
3. Wood nailers and blocking.
4. Fasteners and connectors required for the work.
   a. Tapcon anchors for screwing wood nailer to masonry/concrete.
   b. Wood screws to fasten window frame to nailer.

1.2 SUBMITTALS:

A. Wood Treatment Data:

1. Submit chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material.
2. Preservative Treatment:

   a. For each type specified, include certification by treating plant stating preservative solutions and pressure process used, net amount of preservative retained, and conformance with applicable standards.
   b. For water-borne preservatives, certify that moisture content of materials was reduced to maximum of 19% after treatment and prior to shipping to project site.

1.3 QUALITY ASSURANCE:

A. Standards:

1. Lumber: Comply with PS 20, WWPA Grading Rules and other grading rules as specified.
2. Plywood: Comply with PS 1, "U.S. Product Standard for Construction and Industrial Plywood".

PART 2 - PRODUCTS

2.1 WOOD TREATMENT:

A. Preservative Treatment:

1. Where lumber or plywood is indicated as "Treated", or is specified herein to be treated, comply with applicable requirements of AWPA Standard C2 for lumber and C9 for plywood.
2. Mark each treated item with the AWPB or SPIB Quality Mark.
3. Wood nailers shall be weather resistant to comply with manufacturer's standards for Wolmanized or equal treatment.
4. Wood for nailers shall be #2 or better.

5. Creosote and asphaltic preservatives are not acceptable.
6. Pressure-Treatment for Above-Ground Items: Water-borne preservatives complying with AWPB LP-2. After treatment, rack dry or kiln-dry to a maximum moisture content of 15%. Treat indicated items and the following:

    a. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.

7. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

PART 3 - EXECUTION

Not Used

END OF SECTION 06100

SECTION 07900 JOINT SEALERS

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:
1. Joints between dissimilar materials.
2. Window frames.

1.2 SUBMITTALS:

A. Submit manufacturer's surface preparation and installation instructions under provisions of Section 01300.

1.3 QUALITY ASSURANCE:

A. Applicator Qualifications:
1. Application shall be done by a Joint Sealant Subcontractor with five years experience. Submit documentation to the Architect and Owner.

B. Manufacturer Technical Assistance:
1. Materials shall be supplied by manufacturer who will provide qualified technical assistance at the project site.

1.4 WARRANTY:

A. Submit 2 copies of written 2-year warranty agreeing to repair or replace joint sealers which fail to perform as airtight and watertight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.
B. Provide warranty signed by the Installer and Contractor.

PART 2 - MATERIALS

2.1 MANUFACTURERS:

A. Tremco Manufacturing.
B. Dow Corning.
C. General Electric.
D. Pecora Corporation.
E. Mameco International.
F. Sika Corporation.
G. Sonneborn Building Products.

2.2 SEALANTS:

A. One-Component Acrylic Sealant:
1. Acrylic emulsion sealant, one-part, mildew resistant and paintable, complying with ASTM C834, recommended by manufacturer for general use as an exposed building construction sealant, Pecora AC-20 or approved substitute.
2. Colors:

a. At plaster locations provide paintable white.
b. At glazed masonry locations provide color to match window frame.

B. Two-Component Polyurethane Sealant:
1. Polyurethane-based, 2-part elastomeric sealant, complying with ASTM C920, Type M, Class 25, Grade NS (non-sag), Tremco "Dymeric", Pecora "Dynatrol II".
2. Optional Sealant: Contractor may, at his option, provide 1-Component Silicone Sealant, "Silpruf" by General Electric or #790 by Dow-Corning in lieu of above.
3. Color to match window frame colors.

C. Backer Rod: Compressible, closed cell non-gassing type compatible with required sealant.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Joints:
1. Install sealants to depths as recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:

a. For joints sealed with non-elastomeric sealants and calking compounds, fill joints to a depth in the range of 75% to 125% of joint width.

END OF SECTION 07900

SECTION 08520 - WINDOWS

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes: Operable and fixed aluminum/fiberglass windows

B. Related Sections:
1. Section 07900 - Joint Sealers
2. Section 08800 - Glazing

1.2 SUBMITTALS:

A. Submit two samples 12" long of specified finish on window frame sections showing range of color variation.
B. Submit certified test reports indicating windows conform to specified performance requirements.
C. Submit manufacturer's certified thermal performance test results (ANSI/AAMA 1502.6) showing a condensation resistance factor (CRF) of at least 45.

1.3 QUALITY ASSURANCE:

A. Manufacturers Qualifications: Not less than five years experience in the manufacture of aluminum or fiberglass windows of type specified for the project.
B. Erector Qualifications: Not less than five years experience in the installation of aluminum or fiberglass windows.
C. Standards of Performance and Workmanship: ANSI/AAMA 101, and the applicable general recommendations published by AAMA and AA.
D. Design Criteria:

1. Specific type and model aluminum or fiberglass window by a single manufacturer.
Equivalent windows may be provided if deviations in dimensions and profiles are minor and do not materially detract from the design concept as judged solely by the Architect.
2. Design wind velocity at the site is 100 mph.

E. Performance and Testing: Comply with the air infiltration tests, water resistance tests and applicable load tests specified in ANSI/AAMA 101 for the type and classification of window unit required.

1.4 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to meet performance requirements.
b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
c. Faulty operation of movable sash and hardware.
d. Deterioration of materials and finishes beyond normal weathering.
e. Failure of insulating glass.

2. Warranty Period:

a. Window: 20 years from date of Substantial Completion.
b. Glazing Units: 20 years from date of Substantial Completion.

PART 2- PRODUCTS

2.1 MANUFACTURERS:

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Custom Window Company; Custom Window Series 8300, basis-of-design.
2. Peerless Products.
3. Wausau Window and Wall Systems, x250i-XLT Invent Retro Series.

2.2 MATERIALS:

A. Window Units:
1. ANSI/AAMA Specification AW-100 grade.
2. Include true divided lite mullions, trim, accessories, and operating hardware.
3. Screens (to be provided at all operable windows): Coated aluminum wire complying with FS RR-W-365.
4. Weatherstripping: Required at all windows.
5. Prefinished metal drip edge at all sills.
6. Operating Types: Awning.
7. Interior screens.
8. Hand cranks to operate windows.

a. Provide extra crank handles for Owner's stock.

B. Thermal-Barrier Construction:
1. Integrally concealed thermal barrier, located between extrusions which eliminates direct metal-to-metal contact between exterior and interior.

C. Glazing Compounds: Containing no asbestos.

D. Insulating-Glass Units: ASTM E 2190.

1. Glass: ASTM C 1036, Type 1, Class 1, q3.

a. Tint: Gray. (North windows, clear)
b. Kind: Fully tempered where indicated on Drawings.
c. Thickness: 3/16 inch.

2. Lites: Two.
3. Filling: Fill space between glass lites with argon.
4. Low-E Coating: Pyrolytic or vacuum deposited.

a. On third surface for tinted outdoor lite.
b. On second surface for clear outdoor lite.

5. Narrow muntin detail; true divided lite.
6. Overall Thickness: 1-inch.

2.3 FABRICATION

A. Fabricate aluminum/fiberglass windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
B. Glaze aluminum/fiberglass windows in the factory.
C. Weather strip each operable sash to provide weathertight installation.
D. Provide weep holes and internal passages to conduct infiltrating water to exterior.
E. Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design wind loads of window units.
F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.4 ALUMINUM FINISHES

A. Anodic Finish: Class I complying with AAMA 611.
1. Color: Match Architect's sample.

PART 3 - EXECUTION

3.1 INSPECTION

A. Job Conditions
1. Verify that openings are dimensionally within allowable tolerances, plumb, level, contain solid anchoring surfaces and are in accordance with approved shop drawings.

3.2 INSTALLATION

A. Use only skilled tradesman with work done in accordance with approved shop drawings and specifications.
B. Plumb and align window faces in a single plane for each wall plane. Erect windows and materials square and true, adequately anchored to maintain positions permanently when subjected to normal thermal and building movement and specified wind loads.
C. Adjust windows for proper operation after installation.
D. Furnish and apply sealants to provide a weathertight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 ADJUSTING AND CLEANING

A. After completion of window installation, windows shall be inspected, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be responsibility of general contractor.

END OF SECTION 08520

SECTION 08800 GLAZING

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Float glass.
2. Tinted glass.
3. Tempered glass.
4. Insulating glass units.

B. Related Sections:

1. Section 08520 - Windows.

1.2 SUBMITTALS:

A. Submit manufacturer's product data showing thermal performance characteristics of tinted, coated, insulating glass units, or heat mirror insulating glass units.
B. Submit two samples of each type of glass specified, 12" x 12" in size, illustrating glass, unit, and coloration. Indicate range of variation to be expected for color and "waviness" in final position.

1.3 QUALITY ASSURANCE:

A. Installer shall have a minimum of 5 years experience in projects of similar size and complexity.
B. Conform to Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" for glazing standards.
C. All exterior glass shall withstand a minimum of 30 psf wind load, both positive and negative pressure. Conform to UBC wind loading requirements and the Boulder County Wind Map.
D. Prime (Float) Glass: ASTM C1036.
E. Heat-Treated Glass: ASTM C1048.
F. Insulating Glass: Seal Standard ASTM E774, Class A. Provide units manufactured by SIGMA member and bearing IGCC certification numbers.

1.4 WARRANTY:

A. Provide insulating glass manufacturer's written warranty, agreeing to, within specified warranty period, furnish FOB project site, replacements for insulating glass units which have defective hermetic seals (excluding that due to glass breakage); defined to include intrusion of moisture or dirt, internal condensation at temperatures above -20 degrees F., deterioration of internal glass coatings, and other visual evidence of seal failure or performance failure; provided manufacturer's instructions for handling, installation, protection and maintenance have been adhered to during warranty period.
B. Warranty shall include replacement installation costs.
C. Warranty period is 20 years after seal date permanently imprinted on unit, but not less than 19 years after the date of the Notice of Acceptance.

PART 2 - PRODUCTS

2.1 PRIME (NON-PROCESSED) GLASS:

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFG Industries, Inc.
2. Cardinal Glass Industries.
3. Ford Glass Div.
4. Guardian Industries.
5. LOF Glass, Inc.
6. PPG Industries, Inc.
7. Viracon

B. Clear Float Glass:

1. Type I, Quality q3, Class 1 clear, 3/16 thick except as otherwise required to comply with applicable codes and regulating authorities.
2. Low-E coating is required for all exterior glazing, except doors.

C. Tinted Glass:

1. Type I, Quality q3, Class 2, 3/16" thick except as otherwise required.
2. Glazing must be color-compatible with the building and building location on campus.
3. Grey is the only color permitted on the main campus.
4. Historical character of the building and adjacent buildings must be considered when selecting tinted glass color.
5. Ultra violet filtering glass is desirable.
6. No mirrored exterior glazing permitted on the main campus.
7. Low E coatings are required for exterior glazing, except doors.

D. Insulating-Glass Units:

1. Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
2. Sealing System: Dual seal, with manufacturer's standard primary and secondary.
3. Spacer: Stainless steel.

E. Low-e-coated, tinted insulating glass.

1. Overall Unit Thickness: 1 inch.
2. Outdoor Lite: Tinted.
3. Interspace Content: Argon.
4. Indoor Lite: Clear.
5. Low-E Coating: Pyrolytic or sputtered on third surface.
6. Visible Light Transmittance: 40 percent minimum.
9. Solar Heat Gain Coefficient: 0.41 maximum.

F. Low-e-coated, clear insulating glass.

1. Overall Unit Thickness: 1 inch.

2. Outdoor Lite: Clear.
3. Interspace Content: Argon.
4. Indoor Lite: Clear.
5. Low-E Coating: Pyrolytic or sputtered on second surface.
6. Visible Light Transmittance: 77 percent minimum.
9. Solar Heat Gain Coefficient: 0.61 maximum.

2.2 FABRICATED GLASS UNITS:

A. Factory assembled and sealed units with minimum 5/8 inch space.
B. Provide insulating units with an R-value of 3 minimum.

2.3 GLAZING COMPOUNDS:

A. Containing no asbestos.

PART 3 - EXECUTION

Not Used

END OF SECTION 08800

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Complete painting of all surfaces throughout the interior of the buildings, except as otherwise specified or indicated in the finish schedule.

1.2 SUBMITTALS:

A. Submit 3 sets of samples with scheduled color product type, color formula and texture to simulate actual conditions on 12" x 12" hardboard for Architect and UCB Project Manager review.

B. Resubmit samples, if requested, until required sheen, color and texture is achieved.

C. On actual wall surfaces and other building components, duplicate painted finishes of acceptable samples, as directed by UCB Staff.

D. At beginning of project, provide a complete summary list of specific manufacturer's products, color identification numbers, manufacturer technical data sheets and MSDS Sheets that will be applied in this project. List shall compare each color number with each specified or selected color number. A copy of this list shall be given to the appropriate UCB Project Manager, and Structural Analyst in Work Management Group.

1.3 QUALITY ASSURANCE:

A. Conform to Painting and Decorating Contractors of America "Architectural Specification Manual".

B. All materials shall be applied free from runs, sags, wrinkles, streaks, shiners and brush marks.
All materials shall be applied uniformly. If any reduction of the coating's viscosity is necessary, it shall be done in accordance with the manufacturer's label directions. Unacceptable moisture content should be reported to the architect or the project manager.
A minimum interior temperature of 65° F shall be maintained during the actual application and drying of the paint, and until occupancy of the building occurs. Adequate ventilation shall be maintained at all time to control excessive humidity which will adversely affect the curing of coatings. The Contractor is solely responsible for maintaining suitable temperature and ventilation.
Before painting begins, all other crafts shall have completed their work, and shall have removed all dirt and debris resulting therefrom. The rooms or areas are to be left in broom clean condition.

1.4 MAINTENANCE:

A. Provide Paint formulations for all paint colors.
B. Remove all trash, empty cans, solvents and all painting related materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Benjamin Moore & Company
B. Diamond Vogel
C. The Glidden Company
D. KWAL-Howells, Inc.
E. PPG Industries
F. Sherwin-Williams Company
G. ICI
H. Substitutions must be pre-approved by UCB project manager and UCB paint shop. Any proposed substitution must be available in the Boulder Metro area.

2.2 MATERIALS:
Materials submitted for approval may be asked to match CU's standard off white color sample for testing. Testing shall include, but is not limited to, accurate color match, hiding capabilities, touch-up capabilities, sheen match and other performance characteristics.

A. Quality:

1. Provide the **best quality Contractor grade or better** of the various types of coatings as regularly manufactured by acceptable paint material manufacturers.
2. Materials not displaying the manufacturer's identification as a standard, best-grade product will not be acceptable.
3. Waterborne or latex acrylic coatings shall be used unless prior approval for substitution is obtained.
4. Material Safety data sheets and technical product data sheets must be included with O&M Manuals for all products used.

PART 3 - EXECUTION

3.1 SCHEDULE:

A. For all paint finishes:

1. New surfaces shall have 1 primer coat and 2 finish coats.
2. Existing surfaces shall have minimum 2 finish coats.
3. All walls must be painted with a paint that meets CU's sheen standards for the 16- 32 measurement at 60°, and volume solid's ratings.
4. Patch Painting will not be acceptable, total affected area shall be painted. Terminate painting only at corners or joints.

END OF SECTION 09900